DVR16 = DVR16M – DIGITAL MULTIPLEX RECORDER

1. Introduction

CE

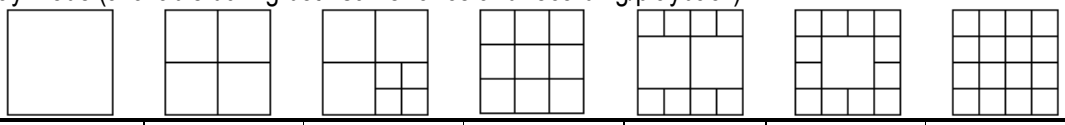
Thank you for choosing the **DVR16M**. It converts analogue NTSC or PAL video to digital images and records them on a removable hard disk drive. Digitally recorded video has several advantages over analogue video recorded on tape. There is no need to adjust tracking. Digital video can be indexed by time schedule or events and you can instantly view video after selecting the time or event. You can freeze frames, fast-forward, fast-reverse, slow-forward and slow-reverse without image streaking or tearing. It can be used as a replacement for both a time-lapse VCR and a multiplexer in a security installation. Read the manual carefully before bringing this device into service.

a) Safety Prescriptions

- Handle this device with care.
- Do not expose this device to direct sunlight.
- Do not use this device near water and protect it against any possible contact with water.
- Do not unplug the power connector before you've correctly switched the device off.
- Use this device solely with the included power adapter.
- Unauthorised attempts to repair may result in fire, electroshock or other hazards.
- This device should be installed and serviced by a qualified person and conform to all local codes.
- Do not switch the power ON and immediately (± 3 sec.) OFF again.
- Use a type of power source as indicated on the manufacturer's label.

b) Features

- Thanks to the wavelet compression format, this device replaces both a time-lapse VCR + a multiplexer.
- 4 audio inputs ; 1 audio output (left-right).
- OSD (on-screen display) and RTC (real-time clock) functions
- Multi screen display mode (available during both surveillance and recording/playback):



Mode	full screen	quad	7CH	9CH	10CH	13CH	16CH
NTSC resolution	704x468 (HxV)	352x234 (HxV)		224x156 (HxV)			176x117 (HxV)
PAL resolution	704x564 (HxV)	352x282 (HxV)		224x188 (HxV)			176x141 (HxV)

- Independent main and call monitor outputs allow for simultaneous multi-camera and full screen viewing.
- Picture-in-Picture (PIP) and 2x2 zoom available in both live & playback mode.
- 16 channels ; each channel has its own name (max. 6 characters).
- Video quality adjustable on each channel.
- 16 channels alarm input, ALARM display & 1 alarm output.
- Power loss memory function: set-up will be memorized in case of power failure.
- Supports 2 removable HDD, IDE type
- Timer for scheduled recording
- Display refresh rate up to 72 IPS NTSC / 60 IPS PAL ; record refresh rate up to 15 IPS NTSC / 12 IPS PAL.
- Quick-search mode: search a fragment by time, event or alarm list.
- Fast forward or reverse from 2X up to 32X and slow forward or reverse from 1/2X to 1/32X.
- Password protectionRS232 and RS485 communication protocol.

c) Specifications

Video Format	NTSC/EIA or PAL/CCIR
HDD Storage	IDE type, UDMA 66 or above, 2 removable HDDs supported
Record Mode	manual / alarm / timer
Search Function	Date & time / event / alarm searching
Camera Input Signal	Composite video signal 1Vp-p/75Ω BNC, 16 channels
Camera Loop Back	Composite video signal 1Vp-p/75Ω BNC, 16 channels
Main Monitor Output	Composite video signal 1Vp-p/75Ω BNC
Call Monitor Output	Composite video signal 1Vp-p/75Ω BNC
Audio Input	4 RCA audio inputs
Audio Output	1 RCA audio output (L/R)
Motion Detect Area	15x12 targets per camera (NTSC) / 15x14 targets per camera (PAL)
Motion Detect Sensitivity	256 levels
Video Loss Detection	yes
Display Refresh Rate	72ips (NTSC), 60ips (PAL)
Record Refresh Rate	15ips (NTSC), 12ips (PAL)
Dwell Time	programmable (1~10 sec)
Picture-in-picture (PIP)	yes (movable)
Key Lock	yes
Picture Zoom	2x2 (movable)
Camera Title	6 characters max.
Video Adjustments	Colour/contrast/brightness
Alarm Input	TTL input, high (5V), low (GND)
Alarm Output	COM, NO
Remote Control	RS232 or RS485
Time Display Format	YY/MM/DD ; DD/MM/YY ; MM/DD/YY ; OFF
Power Source	AC 100-240V ±10% switching adapter
Power Consumption	< 45W
Operating Temperature	10 – 40°C
RS232C / RS485 (bps)	115200 ; 57600 ; 19200 ; 9600 ; 4800 ; 3600 ; 2400 ; 1200
Dimensions	432 x 110 x 325mm (W x H x D)
Weight	5.7kg

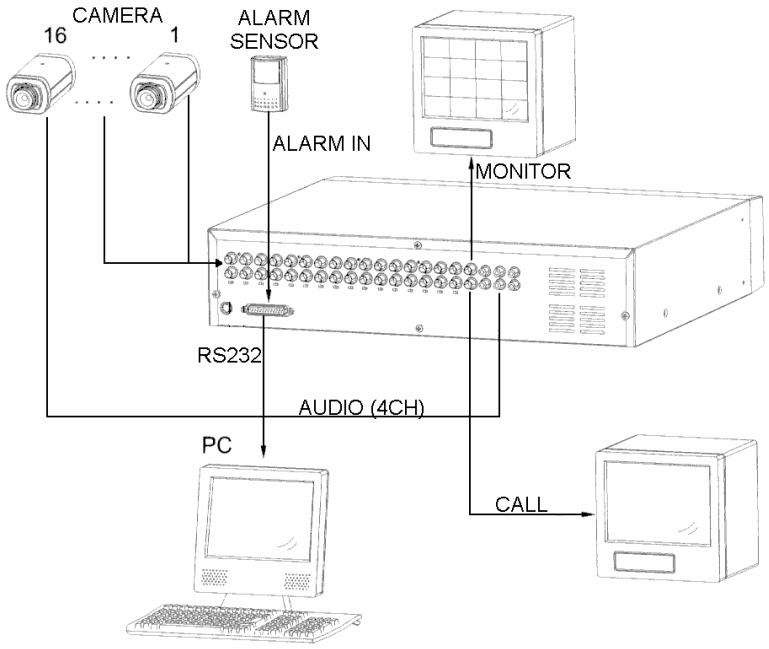
2. Installation

a) Contents

Your **DVR16M** should come with the following items:

- a digital multiplex recorder
- 2 HDD trays
- tray keys
- power cable
- user manual
- rack mounting kit (optional)
- mounting screws
- demounted 15-pin connector

b) Connection with cameras

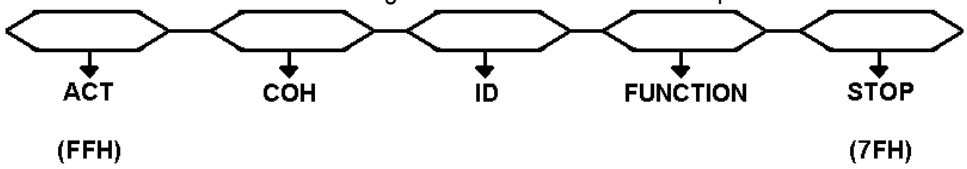


c) Rack Mount Installation

The device can be mounted in a rack with the optional mounting equipment. Fix the smallest side of the mounting plates (with the small holes) to the device (screw holes are provided at the sides) and then fix the device to the rack.

d) RS232 Remote Protocol

You can use the PC keyboard to simulate the DMR keypad.
DATA: REMOTE PROTOCOL using 8-bit data – 1 start bit – 1 stop bit

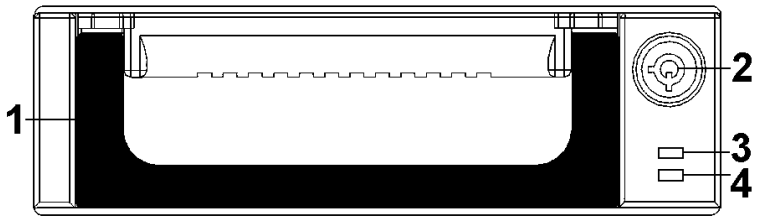


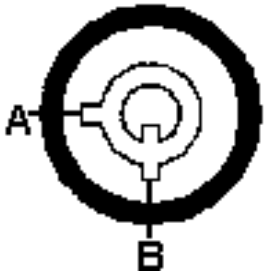
FUNCTION	CODE	ASCII	FUNCTION	CODE	ASCII
KEY_MENU	0 x 4D	M	KEY_CH1	0 x 31	1
KEY_SELECT	0 x 73	S	KEY_CH2	0 x 32	2
KEY_ENTER	0 x 0D	ENTER	KEY_CH3	0 x 33	3
KEY_4CUT	0 x 61	a	KEY_CH4	0 x 34	4
KEY_ZOOM	0 x 5A	Z	KEY_CH5	0 x 35	5
KEY_9CUT	0 x 62	b	KEY_CH6	0 x 36	6
KEY_PIP	0 x 70	p	KEY_CH7	0 x 37	7
KEY_16CUT	0 x 63	c	KEY_CH8	0 x 38	8
KEY_SLOW	0 x 53	S	KEY_CH9	0 x 39	9
KEY_REC	0 x 72	r	KEY_CH10	0 x 41	A
KEY_LEFT	0 x 4C	L	KEY_CH11	0 x 42	B
KEY_UP	0 x 55	U	KEY_CH12	0 x 43	C
KEY_PLAY	0 x 50	P	KEY_CH13	0 x 44	D
KEY_DOWN	0 x 4E	N	KEY_CH14	0 x 45	E
KEY_RIGHT	0 x 52	R	KEY_CH15	0 x 46	F
KEY_POWER	0 x 57	W	KEY_CH16	0 x 47	G
KEY_KEY_LOCK	0 x 4B	K			

3. Configuration

a) Installing HDD

1) HDD Description





1. Handle of the HDD tray
2. Tray lock:
   In position A (cf. drawing on the right), the tray is locked and cannot be removed.
   In position B, the tray is unlocked and can be removed.
   The key lock must be in position A before you switch on the device, if not the hard disk drive cannot be used in a regular way.
3. Power indicator (green LED): lights up when the device is switched on.
4. HDD access indicator (yellow LED).

2) Installing the Hard Drive into the Tray

- Open the plastic HDD compartment door.
- Unlock the tray lock of the desired tray, pull out the handle and pull the tray out of the device.
- Push the release latch at the left ("OPEN") to slide the top cover backwards and remove it.
- Connect the DC power cable and IDE cable to the HDD.
- Insert the HDD in the tray and secure the HDD through the screw holes in the sides.
- Put the top cover back on the tray and slide it forward to secure it.
- Slide the tray back into the device and lock the tray lock.
- Close the plastic HDD compartment door.

When using 2 HDDs at the same time, make sure to set one as 'master' and the other as 'slave' by means of the jumper on the HDDs themselves.
This device does not support hot swap. Power down the unit and leave it off for more than 60 seconds before opening it to replace a HDD.

3) Max. Recording Time

The recording time depends on the recording speed and quality. Please refer to the tables below:
Note: these data are the results of a test during which regular TV programs were recorded

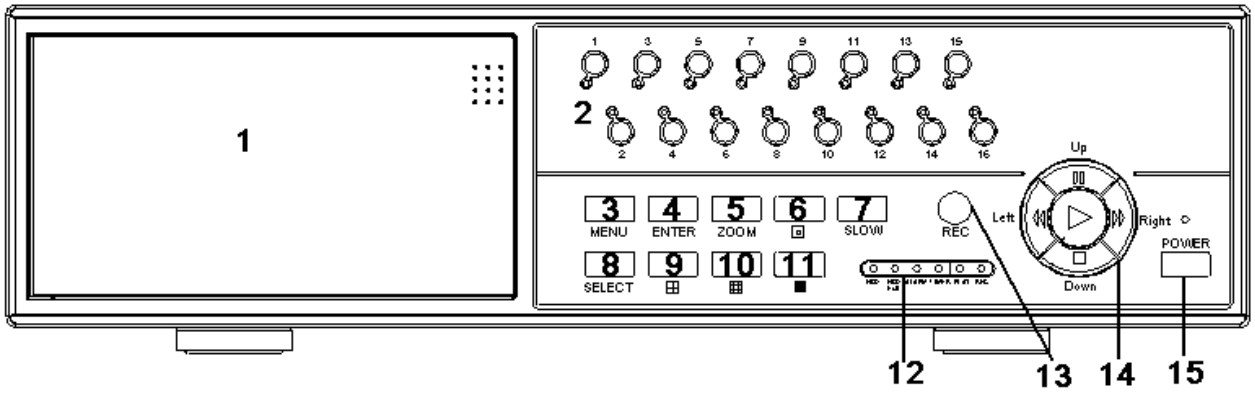
NTSC SYSTEM

IPS		15A	15	8	4	2	1
rec. quality	Best	48hr	96hr	180hr	360hr	720hr	1440hr
	High	60hr	120hr	226hr	450hr	900hr	1800hr
	Normal	96hr	192hr	360hr	720hr	1440hr	2880hr
	Basic	160hr	320hr	600hr	1200hr	2400hr	4800hr
HDD type		240GB					

PAL SYSTEM

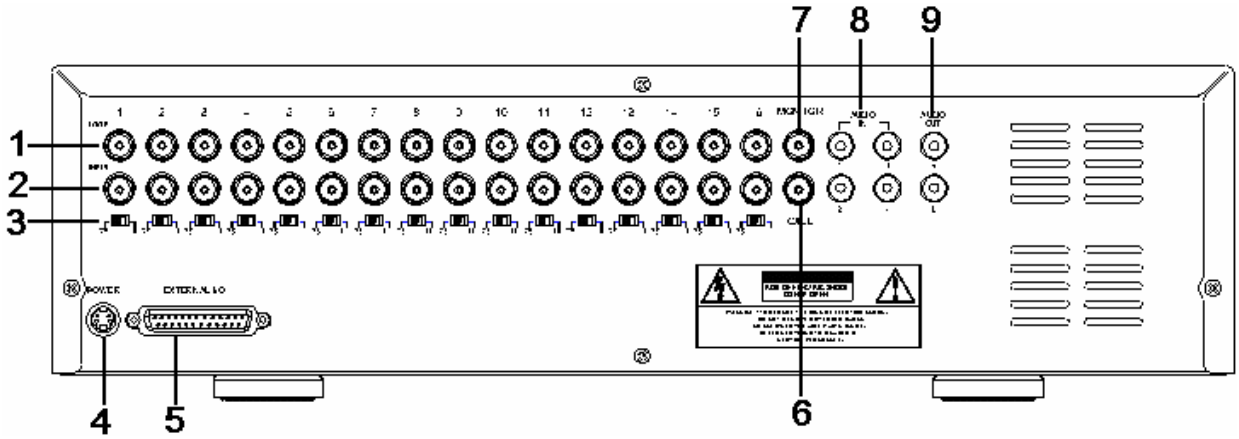
IPS		12A	12	6	3	2	1
rec. quality	Best	48hr	100hr	202hr	406hr	608hr	1216hr
	High	60hr	126hr	254hr	506hr	760hr	1520hr
	Normal	98hr	202hr	406hr	810hr	1216hr	2440hr
	Basic	162hr	336hr	676hr	1350hr	2026hr	4050hr
HDD type		240GB					

b) Control Panel Description



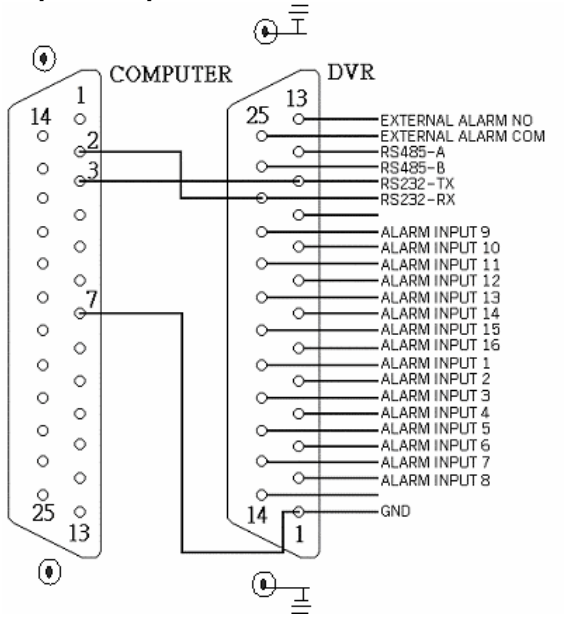
1. HDD trays: behind the plastic door are the 2 HDD trays. Unlock them and pull them out to insert the HDDs.
2. Select keys: press the appropriate camera select key to select the corresponding camera.
3. MENU: Press MENU and enter the password (default: 0000) to access the main menu.
4. ENTER: Press ENTER to confirm data or a selection.
5. ZOOM: Press ZOOM to enlarge the picture displayed on the main monitor.
6. : Press this key to display a picture-in-picture screen.
7. SLOW: Press SLOW to slow down the play speed.
8. SELECT: Press SELECT and one of the channel select keys to display that channel full screen.
9. : Press this key to go to 4 channel display mode.
10. : Press this key to switch to 7, 9, 10 or 13 channel display mode.
11. : Press this key to go to 16 channel display mode.
12. LEDs: HDD: HDD is activated
    HDD FULL: HDD is full
    ALARM: alarm is armed (when alarm is triggered, LED is flashing)
    TIMER: the device is programmed to record
    PLAY: recorded material is being reproduced
    REC: the device is recording
13. REC: Press this button to start recording.
14. Controls for video playback
    ▶: PLAY: to play recorded video.
    ■ /Down: to stop playback or recording. In setup mode it works as a down button.
    II /Up: to pause the fragment. In setup mode it works as an up button.
    ◀◀ /Left: to rewind in PLAY and PAUSE mode. Speed can be adjusted by pressing the REW button several times. In setup mode it works as a left button.
    ▶▶ /Right: to wind forward in PLAY and PAUSE mode. Speed can be adjusted by pressing the FW button several times. In setup mode it works as a right button.
15. POWER: Press this button to power on, and press again to power off.

c) Back Panel Description

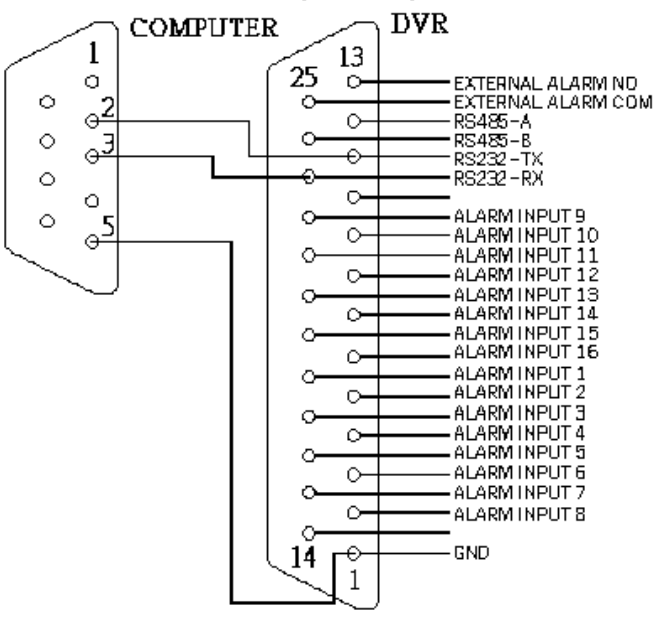


1. LOOP connectors: bring the channel input signal out again to connect to an additional VCR, monitor etc.
2. VIDEO IN: to connect a video source such as a camera.
3. 75/HI switches: set these switches to the right position for the destination device when using the loop function.
4. POWER: connect the provided adapter to this connector and plug it into the mains.
5. External I/O: the device can be controlled remotely by an external device or trigger mechanism.
6. CALL: to connect a call monitor.
7. MONITOR: to connect the main monitor.
8. AUDIO IN: to connect an audio source such as a microphone (only when IPS is 15A for NTSC or 12A for PAL).
9. AUDIO OUT: to connect to a monitor or speaker system (only when IPS is 15A for NTSC or 12A for PAL).

25-pin COM port



9-pin COM port



PIN 1: GND: GROUND
PIN 2: ALARM INPUT 8: By connecting ALARM INPUT 8 (pin 2) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 3: ALARM INPUT 6: By connecting ALARM INPUT 6 (pin 3) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 4: ALARM INPUT 4: By connecting ALARM INPUT 4 (pin 4) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.

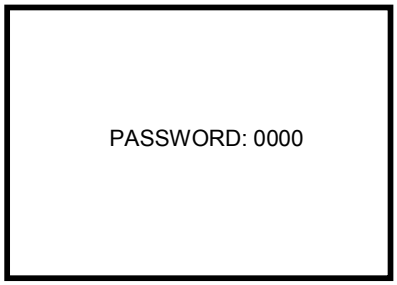
PIN 5: ALARM INPUT 2: By connecting ALARM INPUT 2 (pin 5) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 6: ALARM INPUT 16: By connecting ALARM INPUT 16 (pin 6) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 7: ALARM INPUT 14: By connecting ALARM INPUT 14 (pin 7) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 8: ALARM INPUT 12: By connecting ALARM INPUT 12 (pin 8) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 9: ALARM INPUT 10: By connecting ALARM INPUT 10 (pin 9) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 10: PIN OFF
PIN 11: RS232-TX + PIN 23: RS232-RX: This device can be controlled remotely by an external device or control system, such as a control keyboard, using RS-232 serial communications signals.
PIN 12: RS485-A + PIN 24: RS485-B: This device can be controlled remotely by an external device or control system, such as a control keyboard, using RS-485 serial communications signals.
PIN 13: EXTERNAL ALARM NO + PIN 25: EXT. ALARM COM: During normal functioning COM is connected with NC and not with NO. When there is an alarm trigger, COM disconnects from NC and connects with NO.
PIN 14: PIN OFF
PIN 15: ALARM INPUT 7: By connecting ALARM INPUT 7 (pin 15) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 16: ALARM INPUT 5: By connecting ALARM INPUT 5 (pin 16) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 17: ALARM INPUT 3: By connecting ALARM INPUT 3 (pin 17) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 18: ALARM INPUT 1: By connecting ALARM INPUT 1 (pin 18) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 19: ALARM INPUT 15: By connecting ALARM INPUT 15 (pin 19) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 20: ALARM INPUT 13: By connecting ALARM INPUT 13 (pin 20) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 21: ALARM INPUT 11: By connecting ALARM INPUT 11 (pin 21) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.
PIN 22: ALARM INPUT 9: By connecting ALARM INPUT 9 (pin 22) to GND (pin 1), the **DVR16M** will start recording and the buzzer will be on. Triggering depends on the set level (high/low) under Menu/Camera/Alarm.

4. System Set-up

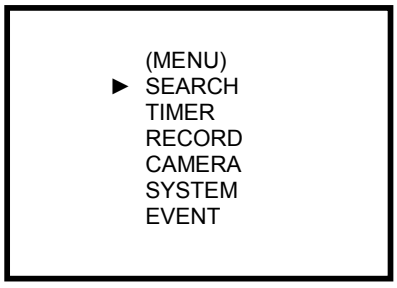
a) Open Main Menu

Press the MENU button on the front of the device. The screen you see on the right will be displayed. You will need to enter a password to access the main menu. Press ◀◀ or ▶▶ (left/right) to change digits and ▮▮ or ■ (up/down) to change the value of the digit. Press ENTER to confirm the password.

e.g.: password: 0000 (default: 0000)



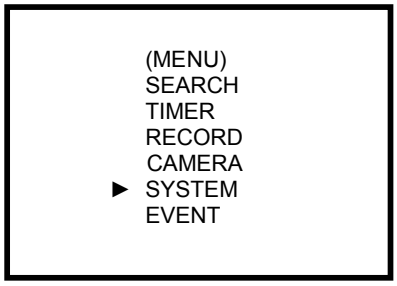
After entering the correct password and confirming it by pressing ENTER, this display will appear:



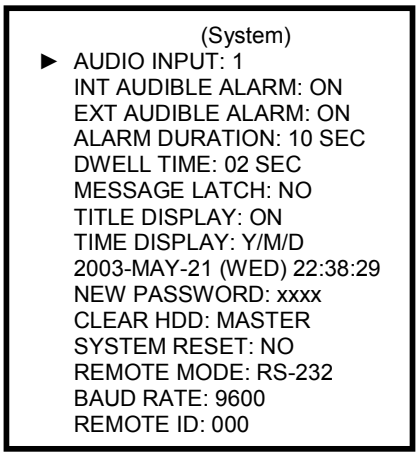
b) System Menu

Press the MENU button on the front of the device, enter the password and confirm it by pressing ENTER (cf. "**4a: Open Main Menu**" on p.7)

Press II or ■ until 'SYSTEM' is selected (cf. figure on the right).



Press ENTER to enter the system set-up menu.
A screen as shown on the right will be displayed.
All instructions below start from this point.



1) AUDIO INPUT Set-Up

1. Press II or ■ to choose 'AUDIO INPUT' and the ENTER button to open the audio input menu.
2. Press II or ■ to set the audio input channel 1~4.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

2) INT AUDIBLE ALARM Set-Up

1. Press II or ■ to choose INT AUDIBLE ALARM and the ENTER button to open the menu.
2. Press II or ■ to choose INT AUDIBLE ALARM: ON/OFF (internal buzzer on/off)
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

3) EXT AUDIBLE ALARM Set-Up

1. Press II or ■ to choose EXT AUDIBLE ALARM and the ENTER button to open the menu.
2. Press II or ■ to choose EXT AUDIBLE ALARM: ON/OFF (external buzzer on/off)
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

4) ALARM DURATION Set-Up

1. Press II or ■ to choose ALARM DURATION and the ENTER button to open the menu.
2. Press II or ■ to choose ALARM DURATION: 10/15/20/30 SEC / 1/2/3/5/10/15/30 MIN / ALWAYS.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

5) DWELL TIME Set-Up

1. Press II or ■ to choose DWELL TIME and the ENTER button to open the menu.
2. Press II or ■ to set the dwell time (period each channel is sequentially shown on the monitor): 01~10 SEC.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

6) MESSAGE LATCH Set-Up

The user can decide whether or not the External Alarm and Video Loss graphs should appear on the monitor.

1. Press II or ■ to choose MESSAGE LATCH and the ENTER button to open the menu.
2. Press II or ■ to set MESSAGE LATCH: ON/OFF.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

7) TITLE DISPLAY Set-Up

1. Press II or ■ to choose TITLE DISPLAY and the ENTER button to open the menu.
2. Press II or ■ to set TITLE DISPLAY (if the title of a channel should appear on the monitor): ON/OFF.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

8) TIME DISPLAY Set-Up

1. Press II or ■ to choose TIME DISPLAY and the ENTER button to open the menu.
2. Select a format with II or ■ : Y-M-D, M-D-Y, D-M-Y (D=day ; M=month ; Y=year) or OFF (time is not displayed).
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

9) TIME Set-Up

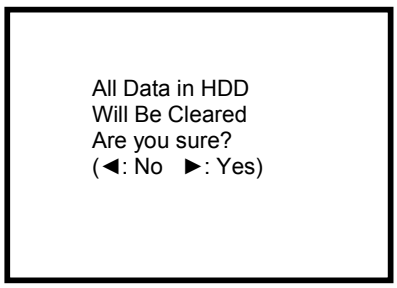
1. Press II or ■ to choose the date and time indication and the ENTER button to open the menu.
2. Press II or ■ to change the value and ◀◀ or ▶▶ to move to the previous or next value.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

10) Change Password (default password : 0000)

1. Press II or ■ to choose 'New password' and the ENTER button to open the password menu.
2. Press II or ■ to change the value and ◀◀ or ▶▶ to move to the previous or next value.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

11) CLEAR HDD Yes / No Set-Up

1. Press II or ■ to choose CLEAR HDD and the ENTER button.
2. Press II or ■ to set CLEAR HDD: MASTER or SLAVE.
3. Press ▶ or ◀ to choose between Yes and No:
   Yes: press ▶ to clear the HDD.
   No: press ◀ NOT to clear the HDD.
4. Press MENU to confirm the current set-up and return to the previous menu.
5. Press MENU again to exit and close the system set-up menu.



12) SYSTEM RESET Set-Up

1. Press II or ■ to choose SYSTEM RESET and the ENTER button.
2. Press II or ■ to choose SYSTEM RESET: YES/NO.
   Yes: to reset the system (**Time & Password set-up will not be changed**).
   No: not to reset the system.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

13) REMOTE MODE Set-Up

1. Press II or ■ to choose REMOTE MODE and the ENTER button to open the menu.
2. Press II or ■ to set REMOTE MODE: RS-232 / RS-485.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

14) Remote Protocol Transmission BAUD RATE Set-Up

1. Press II or ■ to choose BAUD RATE and the ENTER button to open the menu.
2. Press II or ■ to set BAUD RATE: 115200 / 57600 / 19200 / 9600 / 4800 / 3600 / 2400 / 1200.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

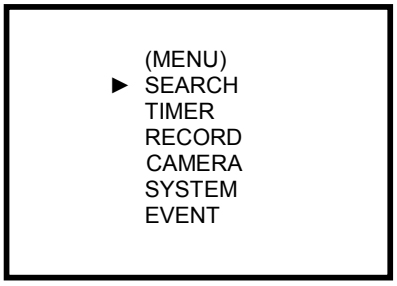
15) REMOTE ID Set-Up (only when RS-232 is selected as remote protocol)

The RS232 protocol allows you to operate several **DVR16M**. The identification number can vary from 000 to 255.
1. Press II or ■ to choose REMOTE ID and the ENTER button to open the menu.
2. Press II or ■ to set REMOTE ID: 000~255.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the system set-up menu.

c) Search Menu

Press the MENU button on the front of the device, enter the password and confirm it by pressing ENTER (cf. "**4a: Open Main Menu**" on p.7)

Press II or ■ until 'SEARCH' is selected (cf. figure on the right).



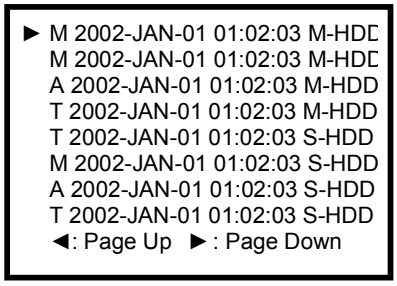
Press ENTER to enter the search set-up menu.
A screen as shown on the right will be displayed.
From here on, follow the steps as indicated below.

1) Last Recording

Press ⏸ or ■ to select 'LAST RECORD' and press ENTER to play the last recording.

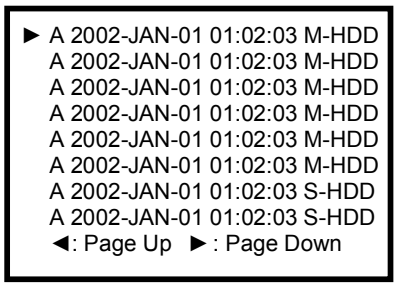
2) Full list of recordings

Press ⏸ or ■ to select 'FULL LIST'. Press ENTER to obtain the full list and a screen as shown on the right will be displayed.
Press ⏪ or ⏩ to switch pages (8 events per page) and select the desired recording with ⏸ or ■ .
Press ENTER to play the selected recording.
M = Manual Recording
A = Alarm Recording
T = Timer Recording
M-HDD = storage in master HDD
S-HDD = storage in slave HDD



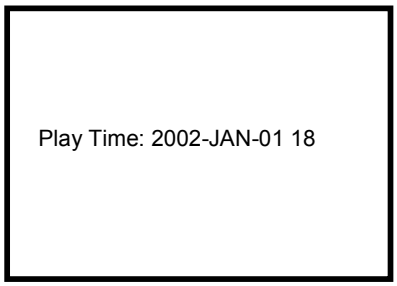
3) Recorded Video in Alarm List

Press ⏸ or ■ to select 'Alarm List'. Press ENTER to obtain the alarm list and a screen as shown on the right will be displayed.
Press ⏪ or ⏩ to switch pages (8 events per page) and select the desired recording with ⏸ or ■ .
Press ENTER to play the selected recording.



4) Search a recording by time

Press ⏸ or ■ to select 'Time Search'. Press ENTER to obtain the search screen and a screen as shown on the right will be displayed.
Press ⏪ or ⏩ to switch parameters and ⏸ or ■ to change the parameter value.
Press ENTER to play the selected recording. If there is no recording available for the time provided, the screen will display "**Not Found**".

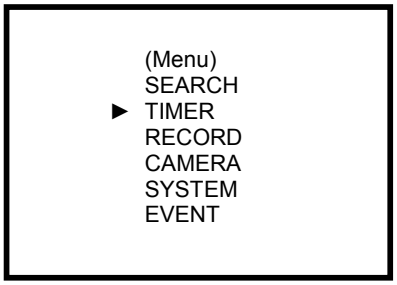


d) Timer Programming

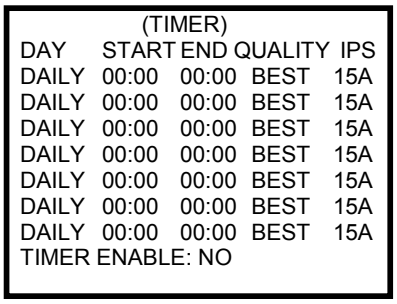
1) Enter "Timer" Menu

Press the MENU button on the front of the device, enter the password and confirm it by pressing ENTER (cf. "**4a: Open Main Menu**" on p. 7)

Press II or ■ until 'TIMER' is selected (cf. figure on the right).



Press ENTER to enter the timer menu. The screen as shown on the right will be displayed.



2) Timer Recording Set-Up

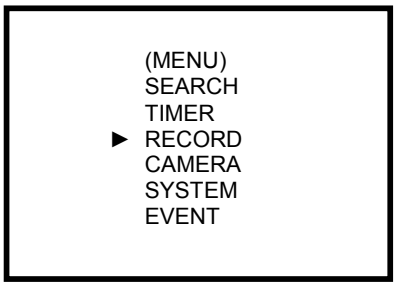
1. Press ENTER to set the day selection of the first line.
2. Press II or ■ to select the day set-up:
   - DAILY : every day
   - MON : Monday
   - TUE : Tuesday
   - WED : Wednesday
   - THU : Thursday
   - FRI : Friday
   - SAT : Saturday
   - SUN : Sunday
   - MO-FR : Monday to Friday
   - SA-SU : Saturday & Sunday
   - JAN-01 : special date.
   - OFF : Not activated
3. Press ◄◄ or ►► to select the recording start time (HH:MM).
   Press II or ■ to set the recording start time.
4. Press ◄◄ or ►► to select the recording end time (HH:MM).
   Press II or ■ to set the recording end time.
5. Press ◄◄ or ►► to select the recording quality.
   Press II or ■ to set the recording quality to BEST, HIGH, NORMAL or BASIC.
6. Press ◄◄ or ►► to select the number of images per second (IPS).
   Press II or ■ to set the number of IPS:
   NTSC : 1, 2, 4, 8, 15, 15A
   PAL: 1, 2, 3, 6, 12, 12A
   REMARK: Recording quality and format are determined in the 'Record' menu (see below).
7. Press MENU to confirm current settings and ENTER to go to the next programming line.
8. Press II or ■ to select 'Timer Enable'
   Yes: to activate the programmed settings.
   No: to ignore the programmed settings.
9. Press MENU to confirm the current set-up and return to the previous menu.
10. Press MENU again to exit and close the Timer menu.

e) Recording Mode Set-Up

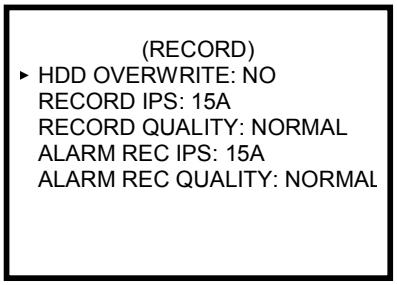
1) Enter "RECORD" menu

Press the MENU button on the front of the device, enter the password and confirm it by pressing ENTER (cf. "**4a: Open Main Menu**" on p. 7)

Press II or ■ until 'RECORD' is selected (cf. figure on the right).



Press ENTER to enter the recording menu. A screen as shown on the right will be displayed.



2) HDD OVERWRITE Set-Up

1. Press II or ■ to select 'HDD OVERWRITE' and press ENTER to open the HDD overwrite set-up.
2. Press II or ■ to set HDD OVERWRITE: YES (HDD overwritten when full) / NO (recording stops when HDD is full)
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the record menu.

3) Recording IPS Set-Up (images per second)

1. Press II or ■ to select 'RECORD IPS' and press ENTER to open the IPS set-up.
2. Press II or ■ to set the IPS recording speed: 15A-15-8-4-2-1 (NTSC) or 12A-12-6-3-2-1 (PAL).
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the record menu.

4) Recording Quality Set-Up

1. Press II or ■ to select 'RECORD QUALITY' and press ENTER to open the recording quality set-up.
2. Press II or ■ to set RECORD QUALITY: BEST, HIGH, NORMAL or BASIC.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the record menu.

5) Alarm Recording IPS Set-Up (images per second)

1. Press II or ■ to select 'ALARM REC IPS' and press ENTER to open the IPS set-up.
2. Press II or ■ to set the IPS recording speed: 15A-8-4-2-1 (NTSC) or 12A-12-6-3-2-1 (PAL).
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the record menu.

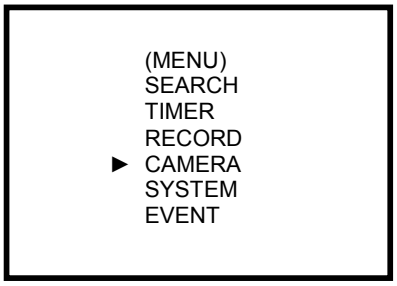
6) Alarm Recording Quality Set-Up

1. Press II or ■ to select 'ALARM REC QUALITY' and press ENTER to open the recording quality set-up.
2. Press II or ■ to set ALARM REC QUALITY: BEST, HIGH, NORMAL or BASIC.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the record menu.

f) CAMERA Set-up

1) Enter CAMERA Menu

Press the MENU button on the front of the device, enter the password and confirm it by pressing ENTER (cf. "**4a: Open Main Menu**" on p. 7)
Press II or ■ until 'CAMERA' is selected (cf. figure on the right).



Press ENTER to enter the alarm menu. A screen as shown below will be displayed.

	TITLE	DWELL	☼	◑	◧	ALARM	RECORD
►	---- 01	ON	5	5	5	LOW	EVENT
	---- 02	ON	5	5	5	LOW	EVENT
	---- 03	ON	5	5	5	LOW	EVENT
	---- 04	ON	5	5	5	LOW	EVENT
	---- 05	ON	5	5	5	LOW	EVENT
	---- 06	ON	5	5	5	LOW	EVENT
	---- 07	ON	5	5	5	LOW	EVENT
	---- 08	ON	5	5	5	LOW	EVENT
	---- 09	ON	5	5	5	LOW	EVENT
	---- 10	ON	5	5	5	LOW	EVENT
	---- 11	ON	5	5	5	LOW	EVENT
	---- 12	ON	5	5	5	LOW	EVENT
	---- 13	ON	5	5	5	LOW	EVENT
	---- 14	ON	5	5	5	LOW	EVENT
	---- 15	ON	5	5	5	LOW	EVENT
	---- 16	ON	5	5	5	LOW	EVENT

2) TITLE

1. Press ◄◄ or ►► to select the title of the channel to be named (initially the name is the channel's number).
2. Press ◄◄ or ►► to change digits and II or ■ (up/down) to change the value of the digit.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the alarm menu.

3) DWELL

1. Press ◄◄ or ►► to select the DWELL setting.
2. Press II or ■ to set DWELL: ON/OFF.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the alarm menu.

4) ☼ (Brightness) / ◑ (Contrast) / ◧ (colour) Set-Up

1. Press ◄◄ or ►► to select the brightness, contrast or colour setting.
2. Press II or ■ to set the level for the selected parameter.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the alarm menu.

5) Alarm Polarity Set-Up

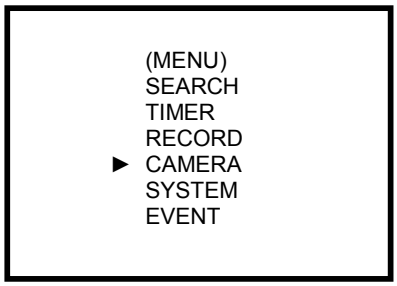
1. Press ◄◄ or ►► to select the alarm polarity setting.
2. Press II or ■ to set the alarm polarity LOW / OFF / HIGH.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the alarm menu.

6) Alarm Recording Mode Set-Up

1. Press ◄◄ or ►► to select the RECORD setting.
2. Press II or ■ to choose the recording mode: EVENT / NORMAL / OFF.
   EVENT: when the alarm on this channel is triggered, it will be recorded more frequently than other channels.
   NORMAL: alarm triggering will not affect the recording frequency of this channel.
   OFF: this channel will not be recorded under any circumstances.
3. Press MENU to confirm the current set-up and return to the previous menu.
4. Press MENU again to exit and close the alarm menu.

g) Motion Detection Set-Up

1) Enter Motion Detection Menu

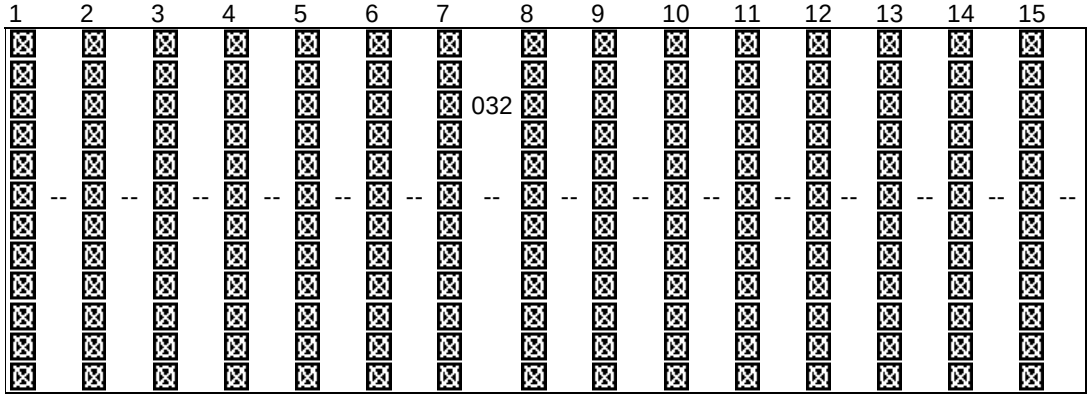


Press the MENU button on the front of the device, enter the password and confirm it by pressing ENTER (cf. "**4a: Open Main Menu**" on p. 7).

Press II or ■ until 'CAMERA' is selected (cf. figure on the right).

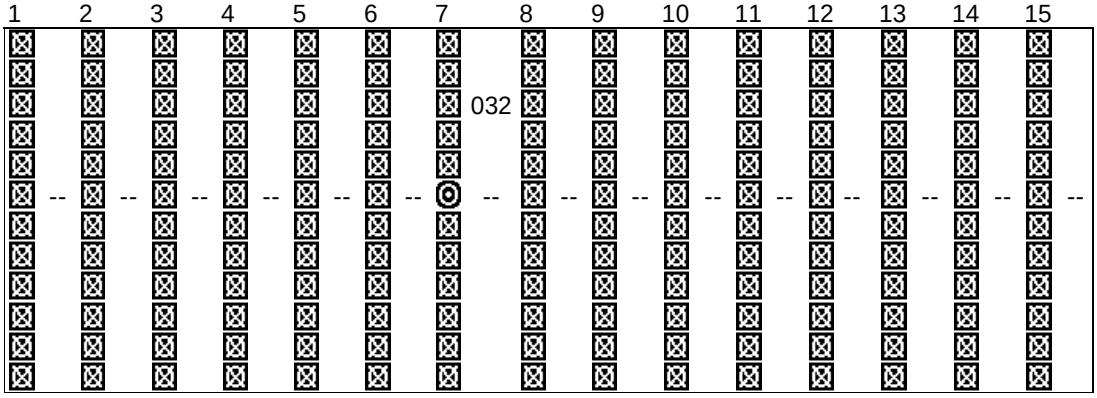
Press ENTER TWICE to enter the motion detection menu. The current camera picture is shown, overlaid with the motion targets (see below). Push the up, down, left & right buttons to move around in the grid.

REMARK: a motion detection will not automatically trigger the live or recording mode. It will only affect the sequence of channels shown in live/recording mode, with the icon appearing when a motion detected channel is shown.

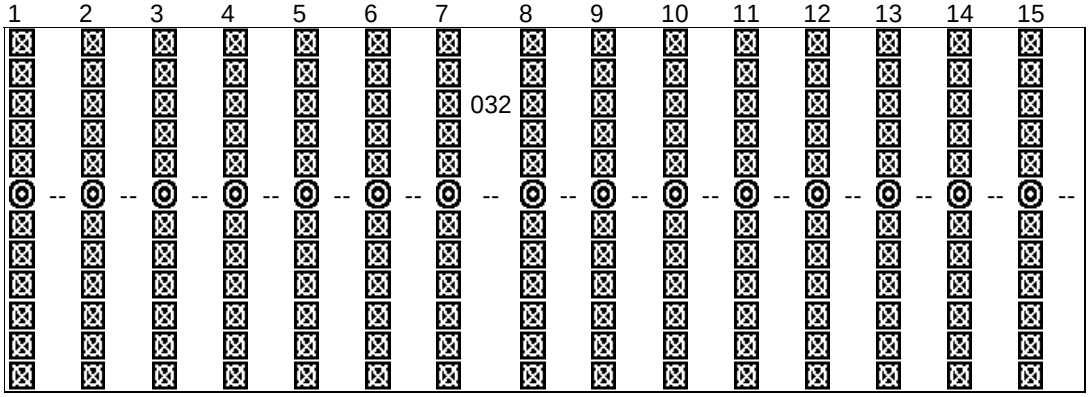


2) Set Detection Area

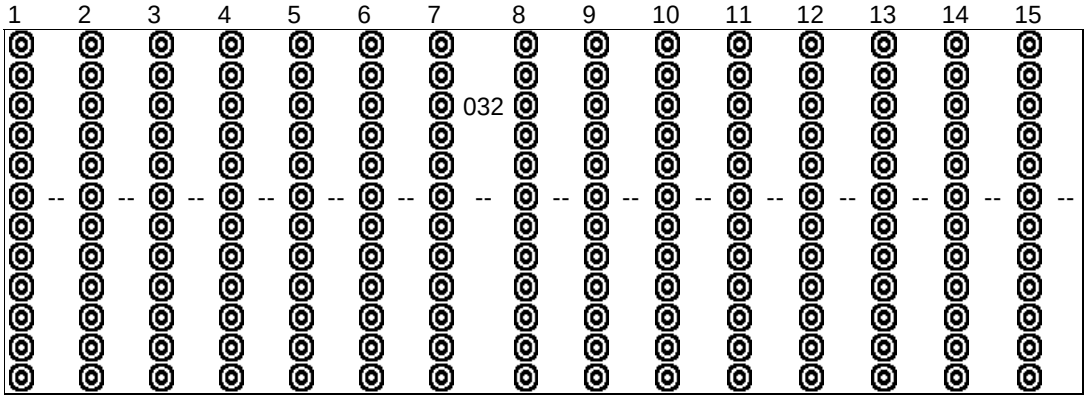
Pressing the ENTER button will activate / deactivate the selected position (see figure below: row 6, column 7). Alternately, you can push the channel select button of the cell on the row you're on that you would like to turn on/off.



Pressing 'ZOOM' will turn all targets in the current row ON of OFF (see below - ex: row 6)



Pressing the PIP button (□) will turn all targets on the screen ON or OFF (see below).

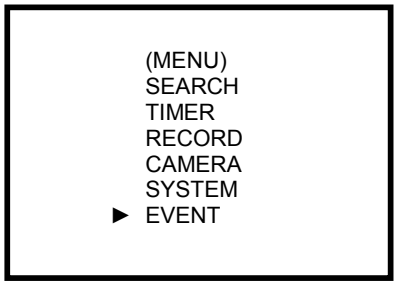


3) Set Sensitivity

Press the "SLOW" button to adjust the detection sensitivity, which focuses on both motion and brightness changes. The value is shown between columns 7 and 8 (see figures above) and the default value is set at 32. A low value means high sensitivity and vice versa. The minimum value (max. sensitivity) is 001; the maximum value is 255.

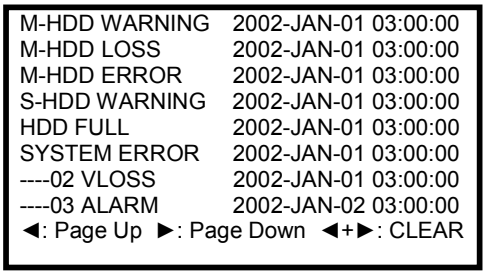
A motion detection will make the concerned channels appear in between the regular channel switching, like: 1-x-2-x-3-x-4-x-5-x-…-x-16-x-1x--2-…, with x representing one (or more) motion detected channels.

h) Event List



Press the MENU button on the front of the device, enter the password and confirm it by pressing ENTER (cf. "**4a: Open Main Menu**" on p. 7)
Press II or ■ until 'EVENT' is selected (cf. figure on the right).

Press ENTER to see the entire 'list of events'. A screen as shown on the right will be displayed.



Press ◄◄ or ►► to switch pages (8 events on 1 page) and press II or ■ to select the desired event.
Press ENTER to play it.

Possible event codes:
M-HDD / S-HDD WARNING: Master/Slave HDD might be failed.
M-HDD / S-HDD LOSS: Master/Slave HDD does not exist/not found.
M-HDD / S-HDD ERROR: Error on Master/Slave HDD
HDD FULL: HDD is full
SYSTEM ERROR: System failure
----02 VLOSS: Video loss on channel 2
----03 ALARM: External I/O alarm on channel 3
POWER RESTORE: Power restore.

5. Operation

a) Power ON

Before turning power ON make sure any HDD has been locked, and the power LED is red. After pressing the POWER button, the POWER LED will turn to orange and all the other LEDs will turn RED, except the LED for HDD. The screen will display "HDD Detecting" ; power on period will be approx. 5 to 15 seconds. If HDD is set as master, the screen will display " Master HDD Connected". If HDD is set as slave, the screen will display " Slave HDD Connected". In order to shorten the power on running time, we suggest setting the HDD as master (by means of the jumper on the HDD itself). When the **DVR16M** has powered on completely, the POWER LED will turn to green.

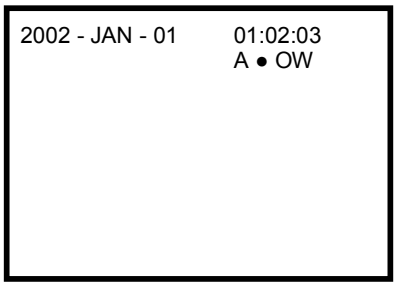
b) Recording

Your DVR16M offers a variety of flexible recording modes. You can set it up to record continuously or programmed, or only to record events ; you can even set the recording speed and resolution. All these options are set through the system menu. If there should be a power cut during recording, the device will automatically resume recording when the power returns. The original recording set-up will be respected.

There are 3 recording modes for your device: alarm recording mode, programmed recording mode and manual recording mode. All recording modes are described here:

1) Alarm Recording

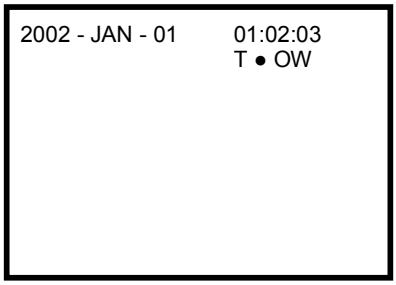
When the **DVR16M** receives an alarm input, it will start to record immediately. The recording speed & quality will be as set in the alarm recording mode set-up.



The screen will be as displayed on the right.
A = alarm trigger
● = recording
OW = HDD overwrite
032GB = if the OW location shows 32GB, it means that there is 32GB recording capacity left on the HDD (1 HDD installed).
001GB
032GB = if the OW location shows these 2 readings, there is 1GB left on the master HDD and 32MB on the slave HDD (2 HDD installed).

2) Programmed Recording

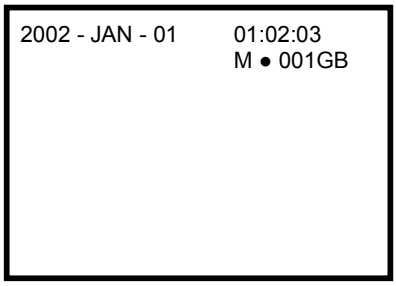
The **DVR16M** will follow the timer set-up to record and the recording speed & quality will be as set in the TIMER menu.



T = Timer recording
● = recording
OW = HDD overwrite
032GB = if the OW location shows 32GB, it means that there is 32GB recording capacity left on the HDD (1 HDD installed).
001GB
032GB = if the OW location shows these 2 readings, there is 1GB left on the master HDD and 32MB on the slave HDD (2 HDD installed).

3) Manual Recording

You can press the REC button to start recording immediately. The recording speed & quality will be as set in the RECORD menu.



M = Manual recording
● = recording
OW = HDD over write
032GB = if the OW location shows 32GB, it means that there is 32GB recording capacity left on the HDD (1 HDD installed).
001GB
032GB = if the OW location shows these 2 readings, there is 1GB left on the master HDD and 32MB on the slave HDD (2 HDD installed).

c) Full Screen Channel Selection

Press one of the camera selection buttons to display that channel full screen.

d) Display Mode Selection

1. Press ⊞, ⊞ or several times ⊞ to select the display mode.
2. Press the SELECT button + ◀◀ or ▶▶ to select a position.
3. Press one of the channel selection buttons to select the desired camera.
4. Press the MENU button to exit.

e) Picture-in-Picture (PIP)

1. Press ▫ to select the PIP screen: a full screen 'background' channel with a 1/16 size screen insert.
2. Press one of the channel selection buttons to select the desired channel for the insert screen.
3. Press the SELECT button and then ◀◀ or ▶▶ to move the insert screen.
4. Press the MENU button to exit.

f) Zoom

1. Press the ZOOM button to enlarge the display of the main picture. The zoom picture is shown full screen, and the full channel image appears in a ¼ size format in an inserted moveable window.
2. Press the ZOOM button again to move the zoom pointer.
3. Press the MENU button to exit.

g) Playback

Press PLAY: the **DVR16M** will go into play mode and will start playing the last recording.

1) Fast Forward (F.F.) & Fast Rewind (F.R.)

- Press PLAY then press ▶▶ for fast forward searching. Press once for double speed, press twice for quadruple speed, 3 times for 8x, 4 times for 16x and 5 times for 32x (maximum speed).
- Press PLAY then press ◀◀ for fast rewind searching. Press once for double speed, press twice for quadruple speed, 3 times for 8x, 4 times for 16x and 5 times for 32x (maximum speed).

2) Slow Forward (S.F.) & Slow Rewind (S.R.)

- Press PLAY then press SLOW for slow play. Press ▶▶ once for half speed, press twice for quarter speed, 3 times for 1/8x, 4 times for 1/16x and 5 times for 1/32x (minimum speed).
- Press PLAY then press SLOW for slow play. Press ◀◀ once for half speed, press twice for quarter speed, 3 times for 1/8x, 4 times for 1/16x and 5 times for 1/32x (minimum speed).

3) Pause

Press PLAY then press PAUSE, the image will be paused.

4) Stop

Press STOP and the DVR16M will stop all actions and display the incoming signal.

5) Image by image

- Press PLAY and PAUSE to pause the image. Press ▶▶ to go to the next image ; keep it pressed to go faster.
- Press PLAY and PAUSE to pause the image. Press ◀◀ to go to the previous image; keep it pressed to go faster. When the very first image is shown, the **DVR16M** cannot return further.

h) Video Loss

The screen will display "  " if the DVR16M does not receive a video signal.

i) Key Lock

Press MENU and ENTER simultaneously to lock the control keys. "KEY LOCK" will be displayed.
Press MENU and ENTER simultaneously and enter the password to unlock the control keys. "KEY UNLOCK" will be displayed.

6. Troubleshooting

What may appear to be a malfunction of the device may not be that serious at all and can be easily corrected. Check the table below before contacting your DVR16M dealer.

PROBLEM	SOLUTION
HDD not found	Make sure a HDD is inserted and connected and that the HDD tray is locked.
No power	Check power source cable connections.
	Confirm that there is power at the outlet.
The device does not react to keys being pressed	Check if it is under key lock mode.
	Press MENU and ENTER simultaneously to exit the key lock mode.
No recorded video	Check if the HDD has been installed properly.
The device does not start recording	Check if 'record enable' is set to "YES"
No live video	Check camera video cable and connections
	Check monitor video cable and connections
	Confirm that the camera is powered
	Check camera lens setting

7. Compatible HDD Brands

Manufacturer	Model	Capacity	Rotation
HITACHI	Deskstar 180GPX (120GB)	120GB	7200rpm
IBM	Deskstar 120GXP (40GB)	40GB	7200rpm
IBM	Deskstar 60GXP IC35I060	60GB	7200rpm
IBM	Deskstar 120GXP (80GB)	80GB	7200rpm
IBM	Deskstar 120GXP (120GB)	120GB	7200rpm
Maxtor	DiamondMax 536DX (60GB) 4W060H4	60GB	7200rpm
Maxtor	DiamondMax Plus 9, Model#6Y120L	120GB	7200rpm
Seagate	Barracuda ATA IV ST340016A	40GB	7200rpm
Seagate	Barracuda ATA V, ST3120023A	120GB	7200rpm
Seagate	Barracuda ATA IV, ST380021A	80GB	7200rpm
Western Digital	Caviar WD400BB-00BSA0	40GB	7200rpm
Western Digital	Caviar WD400EB-00CPF0	40GB	5400rpm
Western Digital	Caviar WD1200BB-00CAA1	120GB	7200rpm

Remarks

- The listed brands have been tested and are compatible with the DVR16M. Do not use other brands than these.
- In order to avoid damage to the HDD, leave the device switched off during at least 60 seconds before removing it.